REMARKS/ARGUMENTS

Applicants have amended their claims to more particularly point out their claimed subject matter, and request the Examiner to reconsider this application in view of the amendments and the following remarks.

The Examiner rejected claim 40 based on Jain et al US Patent No. 6,797,412. Jain teaches a full color display employing light-emitting nanoparticle devices. The Examiner asserts that "the emission device can function as an absorption or modulation device inherently". Office Action at 3. In fact, light emitting and absorption saturation are different physical phenomena and the difference in their device design is non-trivial. Using an emitting device as an absorption modulator or vice versa would generally require significant modification in materials and structure. Accordingly, the Examiner's assertion is not understood and seems to have no basis in Jain's disclosure. To maintain this rejection, more than a mere assertion of "inherency" (which requires disclosure within the four corners of the reference – a disclosure which is not present in Jain et al) is necessary.

In addition, the blue light in Jain's disclosure that the Examiner relies on does not include 365 nm as specifically recited in the claim. Jain discloses a full-color display. For a full-color display, the "blue" light is defined as the spectrum range from 450 nm to 495 nm. Even if one includes the "violet" spectrum, which is defined as from 380 nm to 450 nm, 365 nm is not included. In fact, 380 nm is the shortest wavelength of visible light. In addition, applicants believe the active material listed in the disclosure, ZnCdSe, is not capable of emitting light at this wavelength. It is apparent that Jain did not intend to cover UV wavelengths since the invention was for a full color display.

The Examiner also rejected the claims 20, 27, and 40 as unpatentable over Berneth et al. Berneth's nanoparticles protect the organic UV modulator from degradation. They do not provide modulation. Please see column 1, line 58 to col. 4, line 28 of US Patent 7,190,506. In contrast, applicants' claimed subject matter provides optical modulation using semiconductor nanoparticles. Claims 20 and 40 have been amended to clearly state that the optical modulation is due to nano-particles. This feature in combination patentably defines over Berneth.

The Examiner also has rejected claims 20, 27, and 40 based on Cooper in view of Berggren '707, Murray et al, and Wang at al. The Examiner contends that "To one of ordinary skill in the art it would have been prima facie obvious to engineer ultraviolet responsive nanoparticles …." Office Action at 4.

It should be mentioned that in view of the combined teachings of the applied references, one of ordinary skill in the field of lithography would presumably know little about semiconductor nanoparticles based modulators since the Examiner has not cited any such device being applied to manufacturing of a semiconductor chip. Thus, the four-way prior art combination the Examiner is urging appears to be based on improper use of hindsight.

For example, Berggren teaches optical modulators and switches for telecommunications systems. The wavelength range specified in the Berrgren's claim is 600 nm – 650 nm -- far from the lithography wavelengths required by the claims herein. It is obvious that Berggren did not intend to devise a modulator for lithography wavelengths because his example materials do not work at these wavelengths. Therefore, Berrgren's teachings do not appear to provide a basis for a well known

electrically operable optical modulator working at specific lithographic wavelengths including 193 nm, 248 nm, 157 nm and 365 nm.

The Examiner made an observation that "Applicant's own specification cites Murray and Wang for enablement of ultraviolet responsive nanoparticle modulators." This is incorrect. Actually, the applicant cited Murray et al merely to point out the availability of mono-dispersed wide bandgap semiconductor nanocrystals. Murray does not provide a basis for UV optical modulation. Wang's paper (submitted herewith) uses CdSe nanoparticles, which have a bandgap at ~ 2 eV, still in the visible wavelength. They can not be used in the lithography wavelengths of 365 nm, 248 nm, 193 nm and 157 nm. Moreover, Wang described a band-filling technique to modulate absorption, while applicants' exemplary illustrative non-limiting implementation describes a variety of methods for the modulation, including Franz-Keldysh effect, excitonic effect, Quantum Confined Stark Effect and non-linear optical effects. These physical phenomena, again, may not be known to one with ordinary skill in the lithography field.

All outstanding issues have been addressed and this application is in condition for allowance. Should any minor issues remain outstanding, the Examiner should contact the undersigned at the telephone number listed below so they can be resolved expeditiously without need of a further written action.

The Commissioner is hereby authorized to charge any deficiency, or credit any overpayment, in the fee(s) filed, or asserted to be filed, or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Account No. 14-1140.

Respectfully submitted,

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